



The National Park Service wishes to thank Toyota USA Foundation for donating one million dollars to make National Park Labs possible at Golden Gate National Recreation Area and four other parks across the country.

We also wish to acknowledge the important role played by the National Park Foundation in working with Toyota USA Foundation to establish and guide this generous grant.

National Park Labs is a program of the National Park Service, National Park Foundation, and Toyota USA Foundation. This multi-year program is the first of its kind to provide high school students with experiences that will enhance the quality of science and mathematics and foster stewardship of national park resources. Five national park sites were competitively selected to participate in this exciting endeavor. The other NPL sites are Carlsbad Caverns National Park (NM) and Guadalupe Mountains National Park (TX), Lowell National Historical Park (MA), National Capital Region Parks (DC), and Santa Monica Mountains National Recreation Area (CA).



# Overview

*National Park Labs at the Presidio* is a hands-on education program that engages high school students in a project-based science curriculum. This Educator's Handbook has been prepared for classroom teachers and National Park Service (NPS) and Golden Gate National Parks Association (GGNPA) staff who together make up the National Park Labs education team. It contains the background information, lesson plans, and handouts for the modules that comprise the program.

National Park Labs is a semester-length program consisting of a classroom-based introductory module, three field-based modules, and a culminating activity. The three field-based modules are scheduled to coincide with the seasonal work of the park's restoration team and are not necessarily scheduled in the sequence given below.

**Perspectives** provides the students with an opportunity to get acquainted with the National Park Labs web site, the restoration cycle, and the process of formulating study questions. A word puzzle helps students become familiar with vocabulary that will be used throughout the program. A classroom lesson facilitated by NPS staff gives students a brief history of the Presidio, engages them in a discussion about the mission of the National Park Service, and creates a context for learning about issues in Environmental Justice. After the NPS visit, students create a list of Top Ten Environmental Rights and share a vision of what is and what should be in a national park.

**Plant Propagation** revolves around genetic diversity and plant reproduction. After playing a board game that introduces the concept of genetic diversity, students visit the Presidio's native plant nursery to help with propagation and other nursery functions. In a classroom experiment, students sprout seeds, introduce variable soil conditions, and then monitor the effects of these conditions on the seedlings.

**Invasive Plant Removal and Monitoring** focuses on interdependence in nature. This module begins with a classroom lesson that features *The Private Life of Plants*, a video illustrating the complex interactions between plants, animals, and the abiotic elements of the environment. Students then use the National Park Labs web site to practice using a dichotomous key. During a field visit to the park, students remove invasive plants from a restoration site and perform quantitative and qualitative monitoring studies of the area. The module concludes with a lesson in Environmental Justice and community planning. An optional post-visit lesson can be used to help students understand the global nature of restoration work.

**Planting** begins with a lesson that helps students understand plant structure and adaptation. During the Planting field visit, students study structure and function as they transplant indigenous plants into a restoration site. The field lesson concludes with a look at the importance of volunteers in achieving restoration goals. Back in the classroom, students use the National Park Labs on-line Plant Guide and other resources to create a multicultural quilt of plant uses. An optional post-visit lesson guides students through the process and issues involved in planning a community garden.

A **Culminating Project** is chosen by the teacher and students to fit the needs of the class and allow students to apply what they learned during the program. Classes may choose to create exhibits describing some aspect of their restoration work and present these exhibits at a local restoration fair, or perform a restoration project in a local city park.

## CURRICULUM ORGANIZATION

The modules in this curriculum are divided into pre-visit, on-site, and post-visit lessons. The first page of each module provides an overview of these lessons and summarizes the activities. The second page details the educational standards addressed in the module. The next pages contain background information on topics covered in the module. The lesson plans that follow include a summary, expected duration, materials list, facilitation procedures, and handouts when applicable. The last page of the module is an assessment rubric.

**Icon Key:** Icons used in the lesson plans and summaries designate where the lessons take place and whether the lessons are facilitated by the teacher or NPS staff.

### Location Icons:



**Classroom**



**Park**



**Web-based**

### Facilitator Icons:



**Teacher**



**NPS Staff**

**Glossary:** At the end of the handbook we have included a Glossary of terms for all words that may be new to students or teachers.

## AUTHENTIC ASSESSMENT

Students will keep a journal documenting their thoughts and questions during the program. These journals can be used to assess the students' understanding of important concepts and the evolution of their knowledge and attitudes. Each module includes performance standards, integrated assessment activities, and an achievement rubric to further facilitate evaluation. The rubrics will give teacher and students a clear idea of the learning objectives.

## EDUCATIONAL STANDARDS

The National Park Labs curriculum focuses on science principles learned through authentic restoration activities in a national park. Students also practice applied math skills and examine issues in Environmental Justice that relate to the restoration work. The program is an excellent vehicle for helping students obtain important life skills necessary to find and keep employment, and effectively contribute to society. The standards met in each module are detailed within that module.

The following sources were used to compile the educational standards for the program:

- ▶ **Science:** The science standards correlate directly to San Francisco Unified School District's (SFUSD) life science standards for grades 9 through 12.
- ▶ **Math:** The math contained in the program supports one of SFUSD's key guiding principles for science in grades 9 through 12. This principle states that students will "use technology and mathematics to improve investigations and communications." The specific math standards for each module are based on SFUSD's math standards for grades 9 and 10. These standards serve as a review for the 11th and 12th grade participants. All grade levels benefit from using the applied math within the context of science.
- ▶ **Environmental Justice/Social Studies:** The Environmental Justice/Social Studies aspects of the program meet national behavioral studies standards for grades 9 through 12. These standards are based on information from *Content Knowledge, A Compendium of Standards and Benchmarks for K-12 Education*. The Environmental Justice components are partially derived from *Principles of Environmental Justice* issued by the First National People of Color Environmental Leadership Summit, October 1991, Washington, D. C.
- ▶ **Life Skills:** The program incorporates standards for grades 9 through 12 from the National Life Skills section of *Content Knowledge, A Compendium of Standards and Benchmarks for K-12 Education*.

## PROGRAM LOGISTICS

So that all students may participate in and enjoy their program days at the Presidio, please take careful note of the following:

- ▶ **We must have one completed “Agreement for Sponsored Voluntary Services” form for each class** that participates in the program. We must also have a signed **“Parental Approval” form for each student**. We have provided master copies of these forms on the following pages of this handbook. Please note that park policy requires each individual/group in the program to complete these forms. **Those who do not complete the required forms will not be allowed to participate.** Groups complete and return these forms at the beginning of the school year, or before the first field session in which they will participate.
- ▶ Clothing appropriate to the nature of the activities and weather conditions at the Presidio is required. The following is a list of program-day considerations that need to be conveyed to students so they are prepared and can have a positive learning experience.

**Dress in layers to accommodate the variable temperatures characteristic of the Presidio (clothing and footwear may get dirty).**

**On sunny days, a cap and sunscreen are needed.**

**If there is a chance of rain, bring personal rain gear if possible.**

- ▶ Arrangements can be made to accommodate most students with special needs. Please call the NPS staff to discuss any specific circumstances.

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UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
VOLUNTEERS-IN-PARKS PROGRAM

Golden Gate National Recreation Area

## Agreement for Sponsored Voluntary Services

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NAME OF SPONSOR, ORGANIZATION, OR EVENT

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ADDRESS (Street, city, state, zip code)

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CONTACT PERSON (Liaison for day-to-day operations)

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WORK TELEPHONE (Including area code)

HOME TELEPHONE (Including area code)

Brief description of work to be performed, including minimum time commitment required.

Do work to support native habitat restoration in outdoor restoration areas and the native plant nursery, including (but not limited to) transplanting seedlings, removing invasive species, sowing seeds, collecting seeds, filling flats and pots with soil, disposing of plant material and soil, cleaning up at the nursery and work sites, and moving plants, pots, flats, equipment and tables. Use tools including (but not limited to) picks, shovels, trowels, and shears.

We agree to obtain parental or guardian consent for each individual under 18 years of age and to comply with applicable child labor laws. We understand that the individuals volunteering under this agreement will not receive any compensation for the above work and that they will NOT be considered to be Federal employees for any purpose other than tort claims and injury compensation, and we understand that volunteer service is not creditable for leave accrual or any other employee benefits. We also understand that either the National Park Service, or we, may cancel this agreement at any time by notifying the other party. We agree to provide the National Park Service with a listing of active participants, and the number of hours each contributed, when and as requested.

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Signature

Date

The National Park Service agrees, while this arrangement is in effect, to provide such materials, equipment and facilities that are available and needed to perform the work described above, and to consider you as a Federal employee only for the purpose of tort claims and compensation for work related injuries.

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*Signature of Park VIP Coordinator*

*Date*

### TERMINATION OF AGREEMENT

Agreement Terminated on

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*Month, Day, Year*

*Signature of Park VIP Coordinator*

**Área Nacional Recreativa** (Golden Gate Golden Gate National Recreation Area)  
**Acuerdo de Servicios Voluntarios Auspiciados**

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**Nombre del Auspiciador, Organización ó Evento**

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**Dirección (Calle, Ciudad, Estado, Zona Postal)**

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**Persona Contacto (Enlace para operaciones diarias)**

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**Teléfono del Trabajo**

**Teléfono del Hogar (Incluya Código de Área)**

Descripción Breve del Trabajo que va a Realizar, incluyendo compromiso mínimo de tiempo requerido (Incluya descripción completa de trabajo con este formulario)

*Realizar trabajo para la restauración de hábitats originales en áreas exteriores de restauración y en viveros de plantas autóctonas, incluyendo (pero no limitado) a transplantar plantas jóvenes, remover especies invasoras, sembrar y recoger semillas, rellenar terreno raso y llenar macetas con tierra, disponer de residuos de plantas y tierra, limpiar viveros y áreas de trabajo, mover plantas, macetas, tierra, equipo y mesas. uso de herramientas incluyendo (pero no limitado a) picos, palas, palustres y tijeras.*

Nos comprometemos a obtener consentimiento del padre o encargado de todo individuo menor de 18 años de edad, y a cumplir con las leyes aplicables al trabajo de niños.

Entendemos que los individuos que se ofrecen como voluntarios bajo este acuerdo no recibirán compensación alguna por el trabajo mencionado arriba y que NO serán considerados empleados Federales para propósito alguno excepto reclamos por daños y compensación por lesiones, y entendemos que el servicio voluntario no acredita licencia acumulada ni otros beneficios de empleado. Entendemos además que tanto el Servicio Nacional de Parques, como nosotros, podemos cancelar este acuerdo en cualquier momento mediante aviso a la otra parte. Acordamos proveerle al Servicio Nacional de Parques una lista de participantes activos y el número de horas cuando sea así requerido.

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**Firma**

**Fecha**

El Servicio Nacional de Parques se compromete, mientras esté en efecto este arreglo, a proveer materiales tales como equipo y recursos que estén disponibles y sean necesarios para realizar el trabajo arriba descrito, y a considerarlo a usted como un empleado Federal solamente en cuanto a reclamos por daños y compensación por lesiones.

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**Firma Coordinador de Parques**

**Fecha**

**TERMINACIÓN DEL ACUERDO**

Acuerdo Terminado en

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**Mes, Día, Año**

**Firma Coordinador de Parques**

Form No. 10-89  
(1/83)

UNITED STATES DEPARTMENT OF THE INTERIOR  
NATIONAL PARK SERVICE  
VOLUNTEERS-IN-PARKS PROGRAM

Golden Gate National Recreation Area

## Parent Approval Form

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NAME OF VOLUNTEER

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PARENT OR GAURDIAN'S NAME

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ADDRESS

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PHONE: (Residence)

(Business)

I affirm that I am the parent/guardian of the above named volunteer. I understand that the National Park Service's Volunteers-In-Parks program does not provide compensation, except as otherwise provided by law, and that the service will not confer on the volunteer the status of a Federal employee. I have read the attached description of the work that the volunteer will perform.

I give my permission for \_\_\_\_\_ to participate in this program

sponsored by \_\_\_\_\_  
(Name of sponsoring organization, if applicable)

at \_\_\_\_\_ from \_\_\_\_\_ to \_\_\_\_\_  
(Name of park or office) (Date) (Date)

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(Signature)

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(Date)



Formulario No. 10-89 (Rev. 1/83)  
ESTADOS UNIDOS, DEPARTAMENTO DEL INTERIOR  
SERVICIO NACIONAL DE PARQUES  
PROGRAMA de VOLUNTARIOS DE PARQUES

**Área Nacional Recreativa** (Golden Gate Golden Gate National Recreation Area)  
**Formulario para Consentimiento de los Padres**

Nombre del Voluntario

Nombre del Padre o Encargado

Dirección (Calle, Ciudad, Estado, Zona Postal)

Teléfono del Trabajo

Teléfono del Hogar (Incluya Código de Área)

Declaro que soy el padre/madre o encargado(a) del voluntario referido arriba.  
Entiendo que el Programa de Voluntarios de Parques, del Servicio Nacional de  
Parques, no provee compensación, excepto cuando así lo dispone la ley, y que el ser-  
vicio no ofrece al voluntario la condición de empleado Federal. He leído la descrip-  
ción de trabajo adjunta, que ha de realizar el voluntario.

Doy mi permiso para que \_\_\_\_\_  
participe en esta programa.

Auspiciado por

Nombre de Organización Auspiciadora (si es aplica)

en \_\_\_\_\_ de \_\_\_\_\_ a \_\_\_\_\_  
(nombre del Parque u oficina) (Fecha) (Fecha)

Firma

Fecha